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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,670	03/19/2001	Akiko Itai	P20797	9032

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GREENBLUM & BERNSTEIN, P.L.C.
1950 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER

DEJONG, ERIC S

ART UNIT	PAPER NUMBER
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1631

NOTIFICATION DATE	DELIVERY MODE
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03/19/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com
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Office Action Summary	Application No.	Applicant(s)	
	09/810,670	ITAI ET AL.	
	Examiner	Art Unit	
	ERIC S. DEJONG	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED OFFICE ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/2008 has been entered.

Claims 2-5, 7-10, and 12-14 are canceled. Claims 1, 6, and 11 are pending and currently under examination.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 6, and 11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. This rejection is newly applied.

The recent en banc decision regarding *Bilski v. Warsaw* (2008) set forth that a process is patent-eligible if (1) it is tied to a particular machine or apparatus or (2) it transforms a particular article into a different state or thing. Further, the recent decision in *Comiskey* (2009) confirmed the opinion set forth in *Bilski* of the prohibition pre-empting an abstract idea or mental process in a claim. The revised *Comiskey* decision further reiterated the precedent set forth in *Richman*, 563 F.2d 1026, 1030 (CCPA 1977) wherein the court held the application unpatentable because “if a claim [as a whole] is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.”

In the instant case, the claims are directed to a method of selecting at least one lead candidate compound. The recited process involves the abstract/computational steps of inputting a query molecule and three-dimensional structure of a protein, screening lead-candidate compounds from a database comprising matching chemical features amongst a database of compounds, estimating a binding scheme, and outputting at least one lead-candidate compound. While the instant claims do recite a step involving the input of data, the claims do not recite any specific tie to a machine or apparatus. Further, the instant claims do not recite any transformation of a particular article. Rather, the claimed process is directed to nothing more than the abstract process steps involved in the computational modeling of drug-like compounds *in silico*. Such a method is not statutory as it would wholly pre-empt the abstract computational process described above.

Claim Rejections - 35 USC § 102

The rejection of claim 7 under 35 USC § 102(b) is withdrawn in view of the cancellation of said claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al. (IDS ref: J. Med. Chem. (1994) vol. 37, pp. 4479-4489).

The instant claims are drawn to a method for selecting at least one lead-candidate compound capable of binding as a ligand to a protein. The claimed method comprises the steps of inputting at least one query molecule known to bind or expected to be bound by the protein, screening lead-candidate compounds from a compound database by matching modes of covalent bonds between a query and trial compounds and judging similarities of partial structures of said compounds based on two-dimensional graphs, estimating a binding scheme of the lead-candidate compounds and the query molecule to the protein based on three-dimensional information and outputting at least one lead-candidate compound, and outputting at least one lead-candidate compound capable of binding the protein.

Wang et al. discloses a computer protein kinase C (PK-C) pharmacophore search on 206,876 nonproprietary structures in the NCI 3D-database that led to the

discovery of five compounds which were found to possess PK-C binding affinities (see Wang et al., Abstract). Wang et al. disclose the construction of a PK-C pharmacophore query used in the 3D-database pharmacophoric search (see Wang et al., Figure 1) which is known to bind the PK-C receptor (see Wang et al., page 4480 col. 1, lines 1-17). The results of the computer implemented 3D-database pharmacophore search resulted in the identification of 535 that sufficiently matched the PK-C pharmacophore (see Wang et al., page 4480, col. 1, line 18 through col. 2, line 66). Wang et al. further disclose the visual inspection of 286 compounds of the 535 identified matches for the presence of hydrophobic constituents and further displays the 2D structures of 11 of said 286 compounds wherein atoms and covalent bonds are presented (see Wang et al., Figure 2 and page 4480, col. 2, lines 52-66). Wang et al. further disclose the computational molecular modeling study of known PK-C agonists containing a hydrophobic moiety and the use of this information in the qualitative selection of the final 125 compounds (see Wang et al., page 4480, col. 2, line 46-51 and page 4481, col. 2, line 1 through page 4486, col. 2, line 38). Wang et al. further discloses the synthesis and binding affinity testing of 125 identified compounds (see page 4481, col. 1, lines 1-12). Wang et al. further teaches the molecular modeling using the Quanta molecular modeling package (see Wang et al., page 4480, col. 2, lines 46-50) and detailed three-dimensional structure information of the PK-C receptor, lead compounds, and known PK-C agonists structures (see Wang et al., Table 3 and page 4479, col. 2, lines 10, page 4480, col. 1, lines 1-15, page 4482, col. 2, lines 18-41, page 4483, col. 1, line 1 through page 4484, col. 1, line 30). Wang et al. further teaches the estimation of a

binding scheme between lead compounds, and known PK-C agonists structures to the PK-C receptor and determined that conformational changes of ligands upon binding on protein receptors do not have to be in their global or local energy minima to bind (see Wang et al., page 4485, col. 1, line 30 through page 4886, col. 1, line 9).

Response to Arguments

Applicants' arguments filed 12/17/2008 have been fully considered but they are not persuasive.

In regard to the rejection of claims under 35 USC § 102(b) as being anticipated by Wang et al., applicants reiterate the argument that Wang et al. does not disclose estimating a binding scheme of the lead-candidate compounds to the protein.

Applicants further reiterate the argument that Wang et al. neither teaches nor suggests how the binding scheme of a lead-candidate compound to a protein may be estimated based on "correspondences of the mode of covalent binding of the partial structures of the query molecule and the trail molecules".

In response, it is first noted that the amendment to the instant claim 1 is directed to limitations that were previously presented in dependent claims 6 and 7 (see for example the claim set filed 06/14/2007). Further, it is reiterated from the instant rejection that Wang et al. further teaches the estimation of a binding scheme between lead compounds to known PK-C agonists structures of the PK-C receptor. Wang et al. further teaches the determination that conformational changes of ligands upon binding on protein receptors do not have to be in their global or local energy minima to bind (see

Wang et al., page 4485, col. 1, line 30 through page 4886, col. 1, line 9). Contrary to applicants argument, the determination of the effects conformational changes in modeled ligand structures following receptor binding, as taught by Wang et al., reads directly on estimating a binding scheme of lead-candidate compounds to a protein as instantly claimed. Further, the disclosed modeling of ligand conformations upon protein binding by Wang et al. reads directly on a correspondence of the mode of covalent bonds of partial structures of query and trail compounds as instantly claimed. Therefore it is maintained that Wang et al. fully anticipates the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. DEJONG whose telephone number is (571)272-6099. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIC S. DEJONG/

Primary Examiner, Art Unit 1631